

CLAIMS

What is claimed is:

1        1. A data management system comprising:  
2              a plurality of storage devices individually comprising a physical storage  
3 space, wherein the physical storage space of one of the storage devices is  
4 configured to store a baseline version of a data object and the physical storage  
5 space of an other of the storage devices is configured to store a delta version of  
6 the data object; and

7              processing circuitry configured to control storage operations of at least  
8 one of the storage devices, to process a restore request with respect to the data  
9 object, to access the delta version from the other of the storage devices  
10 responsive to the restore request, and to initiate communication of data of the  
11 baseline version and the delta version of the data object to a computer system.

1        2. The system of claim 1 wherein the processing circuitry is  
2 configured to combine the delta version with the baseline version to provide a  
3 restored version of the data object, and to control the communication of the  
4 restored version of the data object to the computer system.

1        3. The system of claim 1 wherein a client agent of the computer  
2 system is configured to combine the delta version with the baseline version to  
3 provide a restored version of the data object.

1        4. The system of claim 1 wherein the processing circuitry comprises  
2 processing circuitry of the one of the storage devices which stores the baseline  
3 version of the data object.

1        5. The system of claim 4 wherein the one of the storage devices is  
2 configured to receive the delta version from the computer system, and the  
3 processing circuitry is configured to forward the delta version to the other of the  
4 storage devices.

1       6. The system of claim 5 wherein the processing circuitry is  
2 configured to forward the delta version to the other of the storage devices  
3 responsive to a status of capacity of the one of the storage devices.

1       7. The system of claim 5 further comprising a database configured to  
2 store information regarding storage operations of individual ones of the storage  
3 devices, and wherein the processing circuitry is configured to access the  
4 database to obtain a location of the delta version of the data object on the other  
5 storage device responsive to the restore request.

1       8. The system of claim 1 wherein the processing circuitry comprises  
2 processing circuitry of a client agent associated with the computer system.

1       9. The system of claim 1 further comprising a local area network  
2 configured to communicate the delta version intermediate the one and the other  
3 storage devices.

1       10. The system of claim 1 further comprising a storage area network  
2 configured to communicate the delta version intermediate the one and the other  
3 storage devices.

1       11. A data management system comprising:  
2           a plurality of storage subsystem means individually comprising physical  
3 storage means for storing data corresponding to a plurality of data objects and  
4 processing means for controlling storage operations with respect to the  
5 respective physical storage means;

6           database means for tracking storage locations of data of the data objects  
7 in corresponding ones of the storage subsystem means;

8           wherein the processing means of one of the storage subsystem means  
9 comprises means for controlling the storage of a baseline version of a data  
10 object using the respective physical storage means corresponding to the one of  
11 the storage subsystem means and for initiating the storage of a delta version of  
12 the data object using an other of the storage subsystem means; and

13       wherein the database means comprises means for storing information  
14      regarding the storage location of the delta version using the other of the storage  
15      subsystem means.

1           12. The system of claim 11 wherein the processing means of the other  
2      of the storage subsystem means comprises means for uncompressing data of  
3      the delta version, and for initiating communication of the uncompressed data of  
4      the delta version to the one of the storage subsystem means.

1           13. The system of claim 11 wherein the processing means for the one  
2      of the storage subsystem means comprises means for accessing the database,  
3      and means for forwarding a request to the other of the storage subsystem  
4      means to obtain the delta version from the other of the storage subsystem  
5      means responsive to the accessing the database.

1           14. The system of claim 11 wherein the processing means for the one  
2      of the storage subsystem means comprises means for generating a restored  
3      version of the data object using the baseline version and the delta version, and  
4      for outputting the restored version of the data object to a computer system.

1           15. A data management system storage device comprising:  
2          an interface configured to communicate data with respect to other  
3      storage devices of a data management system, and to communicate data of a  
4      data object with respect to a computer system;

5           a physical storage space configured to store a baseline version of the data  
6      object at an initial moment in time; and

7           processing circuitry configured to receive a request to store a delta  
8      version of the data object at a subsequent moment in time after the initial  
9      moment in time, to obtain information regarding a capacity of the storage  
10     device, and to initiate storage of the delta version of the data object using one  
11     of the other storage devices of the data management system responsive to the  
12     analysis.

1       16. The device of claim 15 wherein the processing circuitry is  
2 configured to access a database to identify a storage location of the delta  
3 version, and to output a request to access the delta version to the other of the  
4 storage devices responsive to the accessing the database.

1       17. The device of claim 15 wherein the processing circuitry is  
2 configured to combine the delta version with the baseline version to generate a  
3 restored version of the data object and to control communicating of the restored  
4 version of the data object to the computer system.

1       18. The device of claim 15 wherein the processing circuitry is  
2 configured to initiate the storage using the other of the storage devices  
3 responsive to the obtained information indicating insufficient capacity to  
4 accommodate storage of the delta version.

1       19. An article of manufacture comprising:  
2           a processor-usuable medium comprising processor-usuable code configured  
3 to cause processing circuitry of one of a plurality of storage devices of a data  
4 management system to:  
5           receive a request to store a baseline version of a data object;  
6           effect storage of the baseline version using physical storage space  
7 of the one of the storage devices;  
8           receive a request to store a delta version of the data object after  
9 the effecting storage of the baseline version;  
10          accessing information regarding a status of the one of the storage  
11 devices; and  
12          initiate storage of the delta version using an other of the storage  
13 devices of the data management system after accessing the information  
14 regarding the status.

1       20. The article of claim 19 wherein the processor-usuable code is  
2 configured to cause the processing circuitry to access the delta version stored

3 using the other of the storage devices, and to control communication of data of  
4 the baseline version and the delta version to a computer system.

1        21. The article of claim 20 wherein the processor-usuable code is  
2 configured to cause the processing circuitry to combine the delta version and the  
3 baseline version before the communication.

1        22. The article of claim 19 wherein the processor-usuable code is  
2 configured to cause the processing circuitry to initiate the storage responsive to  
3 the accessed information indicating insufficient capacity of the one of the  
4 storage devices to accommodate storage of the delta version.

1        23. A data management method comprising:  
2            receiving a baseline version of a data object of a computer system using  
3            one of a plurality of storage devices of a data management system;  
4            storing the baseline version using the one of the storage devices after the  
5            reception of the baseline version;  
6            receiving a request using the one of the storage devices, wherein the  
7            request comprises a request to store a delta version of the baseline version;  
8            analyzing a capacity of the one of the storage devices; and  
9            storing the delta version using an other of the storage devices responsive  
10          to the analyzing.

1        24. The method of claim 23 further comprising combining the delta  
2 version with the baseline version providing a restored version of the data object.

1        25. The method of claim 24 wherein the combining comprises  
2 combining using the one of the storage devices.

1        26. The method of claim 24 wherein the combining comprises  
2 combining using a client agent of the computer system.

1        27. The method of claim 24 further comprising maintaining a database  
2 of a stored location of the delta version, and wherein the combining comprises  
3 accessing the database using the one of the storage devices to identify the  
4 stored location of the delta version.

1        28. The method of claim 27 further comprising:  
2            outputting a request from the one of the storage devices to the other of  
3 the storage devices responsive to the identification of the stored location; and  
4            communicating the delta version from the other of the storage devices to  
5 the one of the storage devices responsive to the request.

1        29. The method of claim 23 further comprising forwarding the delta  
2 version from the one of the storage devices to the other of the storage devices.

1        30. The method of claim 29 wherein the forwarding comprises  
2 forwarding responsive to the analyzing determining that an insufficient capacity  
3 of the one of the storage devices exists.